

PCT

WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau



R6

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁷ : H01L 51/20, H05B 33/26, 33/28		A1	(11) International Publication Number: WO 00/22683 (43) International Publication Date: 20 April 2000 (20.04.00)
(21) International Application Number: PCT/US99/23775 (22) International Filing Date: 12 October 1999 (12.10.99) (30) Priority Data: 09/173,157 14 October 1998 (14.10.98) US (63) Related by Continuation (CON) or Continuation-in-Part (CIP) to Earlier Application US 09/173,157 (CIP) Filed on 14 October 1998 (14.10.98) (71) Applicant (for all designated States except US): UNIAX CORPORATION [US/US]; 6780 Cortona Drive, Santa Barbara, CA 93117-3022 (US). (72) Inventor; and (75) Inventor/Applicant (for US only): CAO, Yong [CN/US]; 436 Pomona Court, Goleta, CA 93117 (US). (74) Agents: WHEELLOCK, E., Thomas et al.; Morrison & Foerster LLP, 755 Page Mill Road, Palo Alto, CA 94304-1018 (US).			(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i>
(54) Title: THIN METAL-OXIDE LAYER AS STABLE ELECTRON-INJECTING ELECTRODE FOR LIGHT EMITTING DIODES			
(57) Abstract <p>This invention relates generally to the field of light emitting diodes (LEDs). More particularly, this invention relates to organic light emitting diodes which employ an electron-injecting cathode comprising a thin layer of an oxide of a low work function metal. More specifically, the present invention relates to LEDs which comprise: (a) a hole-injecting anode layer; (b) an electron-injecting cathode layer; and, (c) an emissive layer; wherein (i) said emissive layer is interposed between said anode layer and said cathode layer; (ii) said emissive layer comprises an electroluminescent, semiconducting, organic material; (iii) said cathode layer comprises a layer of metal oxide having a thickness of from about 15 to about 200 Å and, (iv) said metal oxide is selected from the group consisting of alkali metal oxides, alkaline earth metal oxides, lanthanide metal oxides, and mixtures thereof.</p>			